[0026] **FIG. 19** details a further procedure identified in **FIG. 17**; and

[0027] **FIG. 20** details a further procedure identified in **FIG. 17**.

BEST MADE FOR CARRYING OUT THE INVENTION

[0028] A position sensor of the type described by the prior art is illustrated in the cross-sectional view shown in FIG. A. The sensor has conductive outer layers of fabric **A01** and **A02**, separated by an insulating layer **A03**. The purpose of the insulating layer is to prevent electrical contact between the outer layers **A01** and **A02**, except at positions of mechanical interaction. For example, at location **A04** a force, indicated by arrow **A05**, presses the sensor against a solid surface **A06**. The layers are thus pressed into intimate contact and due to the open structure of the insulating layer **A03**, the outer layers come into contact with each other.

[0029] By applying electrical potential gradients across outer layer **A01** and measuring the electrical potential of outer layer **A02**, the location of the mechanical interaction may be determined. In addition, by measuring the current flowing to the outer layer **A02**, an indication of the size of force **A05**, or, alternatively, the area over which it applies a pressure to the sensor, may be determined.

[0030] A fold **A07** in the sensor exemplifies a problem with this type of sensor. The outer layer **A01**, on the inside of the fold becomes compressed and pushes out against the insulating layer **A03**. In addition, due to the open structure of the insulating layer, the layer **A01** pushes out against the outer layer **A02**, and thereby produces an electrical contact **A08** between the conducting layers. The electrical contact **A08** influences the positional voltage measurement and current measurement, and thereby leads to incorrect interpretation of the position and area/force of the mechanical interaction at location **A04**.

[0031] A position sensor **101** embodying the present invention is shown in **FIG. 1**, fabricated from the fabric layers of material and configured to rest on flat and curvilinear surfaces The sensor responds to mechanical interactions and in the specific application shown in **FIG. 1**, these mechanical interactions take the form of manual pressure being applied by users in order to make selections.

[0032] In the example shown in **FIG. 1**, the sensor **101** provides a substitute for a television, video recorder or satellite television remote control. In preference to a solid object providing a series of buttons, the detector is substantially fabric and may adopt a shape defined by soft furnishing. In the example shown, the detector **101** is shown as a separate item but in an alternative configuration, the detector could be included as part of soft furnishing, such as sofa **102**.

[0033] The sensor **101** includes an interface circuit **103** arranged to respond to mechanical interactions and to provide co-ordinate and pressure data over an interface line **104** to a processing device **105**. In response to mechanical interactions effected by a user, positional data is conveyed to processing circuit **105** that in turn transmits infra-red data via an infra-red transmitter **106** to audio visual equipment, such as television **107**.

[0034] An example of a sensor of the type shown in **FIG. 1** is shown in the exploded view of **FIG. 2**. The sensor comprises of two woven outer fabric layers **201** and **202**, separated by a central layer **203**. The central layer **203** is a layer of knitted fabric which may be made from conductive fibre only. Such fibre may, for example, be a carbon coated nylon fibre. However, preferably a yarn is used in the knit which is a mixture of insulating and conductive fibres and such a central layer is described later with respect to **FIG. 9**.

[0035] A first insulating mesh layer **204** is located between the upper fabric layer **201** and the central layer **203**, and a second insulating mesh layer **205** is located between the lower fabric layer **202** and the central layer **203**. The insulating mesh layers **204** and **205** are made from polyester fabric of a warp knit construction. Fabric of this type is readily available and may be used in applications such as mosquito nets.

[0036] Electrically conductive fibres are used when weaving layer **201** and **202**, and so the layers **201** and **202** define two electrically conductive layers. Alternatively, the layers **201** and **202** may be constructed from non-woven (felted), or knitted fabrics or a composite structure. However, in each alternative case, electrically conductive fibres are included in the production of the fabric, thus providing electrically conductive layers.

[0037] Two electrical connectors **206** and **207** are located on a rectangular insulating stripe **208** that is positioned along one edge of fabric layer **201**. The insulating stripe is produced by printing insulating ink onto the fabric but alternatively may be an insulating adhesive tape. The connectors **206** and **207** provide a means of connection from the interface circuit **203** to low resistance elements **209** and **210** respectively. The low resistance elements **209** and **210** are fabricated from fabric coated with metals such as nickel or silver. Material of this type is readily available and is used for shielding equipment from electromagnetic interference. The low resistance elements are attached to the conductive fabric layer **201** and the insulating stripe **208** by a conductive adhesive, such as a pressure sensitive acrylic adhesive containing metallised particles. Therefore, portions **216** and **217** of the low resistance elements **209** and **210** make electrical contact with the conductive fibres of layer **201** along two of its opposing edges. The conductive adhesive ensures a bond is formed between the low resistance elements **209** and **210** and the conductive fibres. Due to the bond, the resistance between the conductive fibres and the contacting portions **216** and **217** remains unaffected by folding or flexing the layer **201**. This is important, as otherwise a 'dry joint' would exist connecting **216** and **217** to **201**, and a varying resistance at the connections would lead to unreliable and, possibly, unstable measurements when the sensor is operated.

[0038] Alternatively, the low resistance elements **209** and **210** are formed by attaching, e.g. by sewing on, a low resistance fibre to the layer **201** and then printing a conductive adhesive or compound onto it and the layer **201**. Alternatively the low resistance elements may be produced by printing an elastomeric material containing conductive particles onto the layer **201**. All of the alternative described methods provide a suitable bond, forming a reliable electrical connection or 'wet joint'.

[0039] The lower fabric layer **202** has a similar construction to the upper fabric layer **201**, having connectors **211** and